भारतीय मानक
Indian Standard

IS 3988 : 2023

ग्वार गम — विशिष्टि

(दूसरा पुनरीक्षण)

Guar Gum — Specification

(Second Revision)

ICS 83.180

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भारतीय मानक ब्यूरो
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August 2023 **Price Group 4**

Plastics Sectional Committee, PCD 12

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Plastics Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

Guar gum is essentially a complex carbohydrate composed of galactose and mannose units. It is extensively used in adhesives, paper, textiles, mining, drilling, explosives and food industries. *Guar* gum is a seed gum developed originally to replace locust bean gum. Although both the gums are galacto-mannans, guar gum hydrates in cold water in wide *p*H range. When present in traces, it has excellent flocculating properties. It is also used as a filter aid. Treated gums are not covered in this standard as they are tailor-made to suit specific industrial applications.

This standard covers two grades, crude gum and refined gum. Edible gum is not covered under this standard.

This standard was originally published in 1967 and subsequently revised in 1981. In this revision, the changes are as follows:

a) cross-referred standards have been updated; and
b) amendment has been incorporated.

The composition of the Committee responsible for the formulation of this standard is given in Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard
GUAR GUM — SPECIFICATION
(Second Revision)

1 SCOPE

This standard prescribes the requirements and methods of sampling and test for guar gum in splits and pulverized form.

2 REFERENCES

The standards given below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the edition indicated were valid. All standards are subject to revisions, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of these standards:

IS No.	*Title*
IS 266 : 1993	Sulphuric acid — Specification (*third revision*)
IS 460 (Part 1) : 2020	Test sieves — Specification: Part 1 Wire cloth test sieves (*fourth revision*)
IS 3434 : l984	Glossary of terms for adhesives and pressure sensitive adhesive tapes (*first revision*)
IS 7437 : 1974	Methods of sampling and test for vegetable adhesive

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 3434 shall apply.

4 TYPES

There shall be two types of guar gum as indicated below:

a) *Type* 1 — Crude gum; and
b) *Type* 2 — Refined gum

5 REQUIREMENTS

5.1 Description

The material shall be obtained from guar seeds harvested from *guar* pods of *Cyamopsis tetragonolobus.* The material shall be either in the form of splits or powder.

5.2 Colour and Appearance

The colour and appearance of the material shall be as agreed between the purchaser and supplier.

5.3 The material, when tested following the methods as prescribed in col (5) of Table 1 shall comply to the requirements given in col (3) and (4) of Table 1 for Type 1 and Type 2 respectively.

5.4 For Pulverized Material Only

5.4.1 *Residue on Sieve*

Unless otherwise agreed, the material shall not leave residue more than 0.5 percent by mass when sieved through 125 micron size [*see* IS 460 (Part 1)].

5.4.2 *Specks*

The number of specks present in the *guar* gum shall not be more than that in the approved sample, when examined visually.

6 PACKING AND MARKING

6.1 Packing

Unless otherwise agreed between the purchaser and the supplier, the material shall be packed as follows:

a) splits, in single or double gunny bags; and
b) pulverized material in polyethylene bags placed in gunny bags or multiply kraft paper.

6.2 Marking

6.2.1 The packages shall be marked with the following information:

a) Name, type and form of the material;
b) Manufacturer's name and recognized trade-mark, if any;
c) Month and year of manufacture;
d) Mass of the material in the container;
e) Batch number; and
f) Any other statutory requirements.

6.2.2 *BIS Certification Marking*

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

7 SAMPLING

Representative sample of the material for the purpose of testing shall be selected as prescribed in **4** of IS 7437.

7.2 Number of Tests and Criteria for Conformity

7.2.1 *Number of Tests*

All the characteristics shall be tested on the composite sample.

7.2.2 The lot shall be declared as satisfying the requirements of the specification if all the test results on the composite sample satisfy the relevant requirements specified.

Table 1 Requirements for *Guar* Gum

(*Clauses* 5.3 *and* B-4.2)

Sl No.	Characteristic	Requirement		Methods of Test
		Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)
i)	Moisture, percent by mass, *Max*	13.0	13.0	**5** of IS 7437
ii)	Ash, percent by mass, *Max*	1.5	1.0	**6** of IS 7437
iii)	Protein, percent by mass, (on dry basis), *Max*	9.0	5.0	**16** of IS 7437
iv)	Residue insoluble in acid, percent by mass, *Max*	14.0	7.0	Annex A
v)	Gum, percent by mass, *Min*	65.0	75.0	**22** of IS 7437
vi)	Viscosity at 27 ºC, in centipoises (cP), *Min*	1 000	2 500	Annex B
vii)	*p*H	5.5 to 8	5.5 to 8	**9** of IS 7437

ANNEX A

[*Table* 1, *Sl No.* (iv)]

DETERMINATION OF RESIDUE INSOLUBLE IN ACID

A-1 REAGENTS

A-1.1 Dilute Sulphuric Acid — dilute 2.6 ml of concentrated sulphuric acid (IS 266) to 200 ml with water.

A-1.2 Kieselghur — lavigated and calcined

A-2 PROCEDURE

A-2.1 Weigh accurately about 2 g of the material in a beaker. Add 150 ml of dilute sulphuric acid and stir the solution with a rubber-tipped glass rod. Cover the beaker with a watch glass and heat the mixture on a steam bath for 6 h rubbing down the wall of the beaker frequently with rubber-tipped glass rod and replacing the water lost by evaporation. At the end of 6 h heating period, add about 500 mg of kieselghur, accurately weighed; and filter the solution through a tared gooch crucible provided with an asbestos pad. Wash the residue several times with hot water, dry the crucible and its contents at 105 ºC ± 2 ºC for 3 h. Cool in a desiccator and weigh. Repeat the operation till constant mass is obtained.

A-3 CALCULATION

Residue insoluble in acid, percent by mass =

$$\frac{M_4 - (M_2 + M_3)}{M_1} \times 100$$

where

M_4 = mass, in g, of the gooch crucible with residue and kieselghur;

M_2 = mass, in g, of the dry gooch crucible with asbestos pad;

M_1 = mass, in g, of the material taken for the test; and

M_3 = mass, in g, of the kieselghur.

ANNEX B

[*Table* 1, *Sl No.* (vi)]

DETERMINATION OF VISCOSITY

B-1 OUTLINE OF THE METHOD

Viscosity of the solution is determined by Brookfield viscometer.

B-2 APPARATUS

B-2.1 Brookfield Viscometer

B-3 REAGENT

B-3.1 *iso*-Propyl Alcohol

B-4 PROCEDURE

B-4.1 Weigh accurately 4.00 g of the material in a 600 ml beaker. Fix a stirrer and thermometer in it. Add 20 ml of isopropyl alcohol and mix it thoroughly so as to form a slurry. Add 400 ml of boiling water quickly while stirring the solution rapidly. If there are any lumps in the solution, discard and prepare the fresh solution until a clear solution is obtained. Cool and stir the solution until the temperature drops to 80 ºC. Place the beaker on a water bath maintained at about 85 ºC and stir frequently for 10 min. Remove the beaker and place it in a water bath maintained at 27 ºC ± 2 ºC. Stir the solution and add water so that the final weight of the beaker is 400 g more than the tare weight of the beaker. Adjust the temperature of the solution to 27 ºC ± 2 ºC and measure its viscosity with Brookfield viscometer RVF model at 20 rev/min using spindle No. 3. Other viscometers may also be used provided they have been calibrated against Brookfield viscometer. Maintain the solution for 24 h at 27 ºC ± 2 ºC and again determine the viscosity at 27 ºC ± 2 ºC.

B-4.2 The limit prescribed in Table 1 shall be taken to have been satisfied if the viscosity of the solution both before and after 24 h period is not less than the prescribed value.

ANNEX C

(*Foreword*)

COMMITTEE COMPOSITION

Plastics Sectional Committee, PCD 12

Organization	*Representative(s)*
Central Institute of Petrochemicals Engineering & Technology (CIPET), Chennai	Prof (Dr) Shishir Sinha **(*Chairperson*)**
All India Plastics Manufacturers Association (AIPMA), New Delhi	Shri Deepak Ballani
Central Institute of Petrochemicals Engineering & Technology (CIPET), Chennai	Dr S. N. Yadav Dr Smita Mohanty (*Alternate*)
Central Pollution Control Board, New Delhi	Ms Divya Sinha Shri C. K. Dixit (*Alternate*)
Chemical and Petrochemical Manufactures Association (CPMA), New Delhi	Shri Uday Chand
Coca-Cola India Pvt Ltd, Gurugram	Shri Virendra Landge Shri Rajendra Dobriyal (*Alternate*)
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Organization	*Representative(s)*
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Indian Institute of Packaging (IIP), Mumbai	Shri Madhab Chakraborty Dr Tanweer Alam (*Alternate*)
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National Committee on Plasticulture Applications in Horticulture (NCPAH), Ministry of Agriculture & Farmers Welfare, Govt of India, New Delhi	Shri Anand Zambre Shri Krishna Kumar Kaushal (*Alternate*)
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Member Secretary
Shri Shivam Dwivedi
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